

Remarks

Claims 1-6, 8-20, 22-34 and 36-40 remain in the case, claims 7, 21 and 35 having been canceled.

In entitling their invention and in describing their invention, the applicants have emphasized the significance of bright object as well as bright star exclusion.

Thus for example the title includes the words “bright object exclusion” and in describing the state of the art, the specification recites “the entries corresponding to stars intruded by bright objects such as planets, asteroids, or comets, need to be excluded from the star catalog or sub-catalog, i.e., excluded from consideration by the algorithm. This is so that bright objects are not mistaken for stars, or the light from the objects does not corrupt the measurements made by the star sensor. Traditional object-based catalog entry exclusion is performed on the ground. These stars intruded by planets or other bright objects are excluded from a revised copy of the on-board star catalog. The revised star catalog is then uploaded to the spacecraft control processor (SCP). The uploading is time-consuming and may easily be interrupted. This may cause delays in the proper attitude determination or errors in the on-board version of the catalog. Traditionally, there is only one stayout zone for each objection in the exclusion algorithm. All the stars inside the stayout zone are excluded from the star catalog so that the bright planet/object will not be mistaken as a star during attitude determination. The exclusion zones may be excessively large and over-inclusive. The number of stars excluded may be such that attitude determination performance may be reduced.” (paragraph 0006 and 0007).

The invention improves the performance of the attitude determination system by allowing fewer stars to be excluded by the spacecraft in the exclusion system. The invention in essence includes more stars than was previously possible, making more stars available for attitude determination.

As amended, the independent claims all recite that the exclusion of a star is dependent on properties of the star and properties of the object, and particularly where that property is brightness. This limitation was set forth, for example, in original claim 7 (now canceled), and therefore does not present a new issue or new matter.

This feature is not taught by Bender as is admitted by the Examiner (see page 5 of the office action dated 6/21/06) and as is clear from a consideration of Bender.

Bender has defined the steps of his method for example at column 2, lines 13-34 and elsewhere in his specification, drawings and claims. Nowhere in the Bender patent is there any reference to exclusion of a star based on its brightness or for that matter calculating multiple stayout zones as contemplated by the applicants.

The rejection of the claims 1-7, 9, 10, 15-21, 23, 24, 29-32, 34 and 35 under 35 U.S.C. 102(b) must therefore be withdrawn.

The rejection of the claims 8, 11-14, 22, 25-28, 33 and 36-40 under 35 U.S.C. 103(a) over Bender is also without merit.

The Examiner's statement that Bender teaches a method/system that performs equally well in order to track a star and determine a vehicle attitude has no application to patentability. That there are other systems and methods for accomplishing a purpose does not, without more, render an invention obvious.

In view of the above, entry of the amendment for consideration and allowance of the claims are respectfully requested.

Respectfully submitted,

OSTRAGER CHONG FLAHERTY
& BROITMAN P.C.
Customer No. 44702

/evelyn m. sommer/

Evelyn M. Sommer
Reg. No. 19,603

Joshua S. Broitman
Reg. No. 38,006

250 Park Avenue, Suite 825
New York, NY 10177-0899
T: 212-681-0600
F: 212-681-0300
Attorneys for Applicants

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